

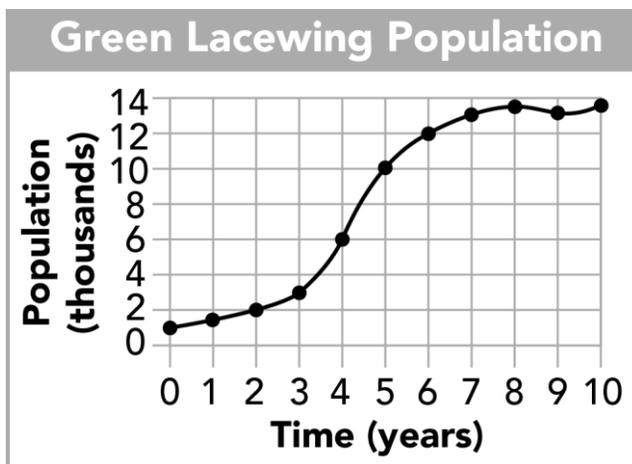
# National End-of-Course Practice

## Chapter 5

### Directions

For multiple choice questions, write the letter that best answers the question or completes the statement on the line provided. For other question types, follow the directions provided.

1. Green lacewings are used to control aphids, which are pests of many crops. A population of 1000 green lacewings is released into a farmer's field. The graph shows the change in the population over time.



What is the most likely explanation for the approximately constant population of the lacewings after the eighth year?

- (A) The lacewings had eaten all of the aphids in the field.  
(B) The lacewing population had reached the carrying capacity of the field.  
(C) New predators of lacewings had arrived in the field.  
(D) The birthrate of lacewings had increased, while the death rate remained constant.  
(E) The death rate of lacewings had increased, while the birthrate remained constant.
2. About 800 ash trees live in a tract of conservation land. Which of these events would have the LEAST effect on the land's carrying capacity for ash trees?
- (A) Maple trees are introduced to the land, where they grow well.  
(B) Human activities drain about half of the water that the land generally receives.  
(C) A beetle that infects ash trees is introduced to the land.  
(D) About one third of the ash trees are cut down and hauled away.  
(E) About one third of the land is cleared of all trees and used for new houses.

3. A lake is home to many native fishes and aquatic plants. Which of these events is MOST likely to threaten the biodiversity of the lake ecosystem?
- (A) a 20 percent increase in the population of one of the native fish species
  - (B) the arrival of migrating birds that prey on the native fishes
  - (C) the introduction of a nonnative fish species that has no natural enemies in the lake
  - (D) a storm that temporarily swells the lake and floods the surrounding land
  - (E) the arrival of typical winter weather that causes the water to freeze
4. For many years in the 1800s, human hunters on the U.S. Great Plains hunted bison almost to extinction. Which statement, if true, BEST explains why the hunters were such a threat to the bison population?
- (A) The death rate from hunting was much greater than the maximum birthrate of the bison.
  - (B) The death rate from hunting was much greater than the natural death rate of the bison.
  - (C) The hunting removed individuals of all ages, including very young bison.
  - (D) Human hunters had replaced the natural predators of the bison.
  - (E) The hunting removed both male and female bison equally.
5. In a tundra ecosystem, the carrying capacity for arctic hares is about 400 individuals. Which of these events is MOST likely to reduce the carrying capacity for arctic hares in the ecosystem by at least 25 percent?
- (A) a severe storm that kills about 100 adult and young arctic hares
  - (B) a 25 percent decrease in the populations of foxes, wolves, or other predators of arctic hares
  - (C) the arrival in the ecosystem of a species that competes with the arctic hare for its food
  - (D) a temporary increase in the arctic hare population to more than 425 individuals
  - (E) a mutation that introduces a new fur color to the arctic hare population

6. Hiram fills a Petri dish with agar, which is a growth medium for bacteria. Then he raises a colony of bacteria in a Petri dish. For the first week, he observes the colony double in number every 1.5 days. Then he predicts that during the second week, the pattern of exponential growth will change to a pattern of logistic growth.

If Hiram's prediction is correct, which MOST likely will be the cause of the change in the growth pattern of the bacteria?

- (A) The rate of bacterial reproduction will decrease gradually over time in any growth medium.
- (B) The amount of agar in the Petri dish will act as a limiting factor on the bacterial colony.
- (C) A random mutation will produce bacteria that cannot reproduce, and so they die off quickly.
- (D) As the bacteria population increases, the sizes of individual bacteria will become smaller.
- (E) As the bacteria population increases, the rate that bacteria reproduce will increase.

**Refer to the paragraph and table to answer questions 7 and 8.**

Deana is studying the table shown here, which lists the birthrate and death rate for several countries.

**2014 Birthrate and Death Rate, by Country**

| Country   | Birthrate<br>(per 1000 People) | Death Rate<br>(per 1000 People) |
|-----------|--------------------------------|---------------------------------|
| Brazil    | 14.7                           | 6.1                             |
| Cambodia  | 24.1                           | 6.1                             |
| Italy     | 8.3                            | 9.8                             |
| Mali      | 43.5                           | 10.5                            |
| Venezuela | 19.6                           | 5.5                             |

7. Deana applies the data in the table to calculate the rate of population increase or decrease of each country.

Which assumption is necessary for Deana's calculations to be accurate?

- (A) The immigration and emigration rates of the countries are insignificantly small or approximately equal.
- (B) The immigration rates of the countries are much higher than the emigration rates.
- (C) The immigration rates of the countries are much smaller than the emigration rates.
- (D) The population is evenly distributed between rural, suburban, and urban areas.
- (E) The population of Italy is mostly urban, while the populations of other countries are mostly rural.

8. Which conclusion is MOST strongly supported by the data in the table?
- (A) The population of each country is increasing at approximately the same rate.
  - (B) The population of each country is increasing at different rates.
  - (C) Nutrition, sanitation, and medical care are about the same in each country.
  - (D) All of the countries except Italy have passed through the demographic transition.
  - (E) Italy has passed through the demographic transition, while the other countries have not yet passed through it.
9. A prairie nature reserve is home to a population of pheasants. This year, the population of pheasants has increased sharply, and scientists think the population has exceeded the carrying capacity. The reserve is also home to a small, scattered population of bison. Scientists think that the bison population is significantly below carrying capacity, although it has been increasing gradually from year to year.
- Both the pheasant and bison populations of the nature reserve could be affected by a variety of limiting factors. Which limiting factor affects both populations about equally?
- (A) competition within the population for food and water
  - (B) parasites that spread among species members
  - (C) a wildfire that spreads across the prairie grasses
  - (D) competition within the population for living space
  - (E) native predators that hunt and kill species members

10. The graph describes the birthrate and death rate for the human population in China from 1950 to 2010. Events that affected the population included a famine in the 1960s, and the one-child policy enacted in the late 1970s. This policy generally limited families to one child each.



Source: Our World in Data

Describe how the population of China has changed during the time period shown in the graph. Does the graph suggest whether or not China has passed through the demographic transition? Explain.